planetary nebula H. IV. 37, the position of which is in R.A. 17h. 58m. 36s., N.P.D. 23° 21′·8 for 1880. The nebula appears in the South-refractor as a somewhat elliptical disk, whose major axis is about half a minute, and has in the centre a well-defined point resembling a star of the eleventh magnitude. This point was compared in declination with a star to the north of the tenth magnitude, preceding the nebula by 25s., the same method of observing being used that had been adopted in Dr. Brunnow's earlier researches on stellar parallax. The observations extend over thirty-three nights, from 1871, August 13, to 1872, August 6, and their discussion gives for the parallax of the nebula, + 0″·047 ± 0″·030. Prof. Bredichin, in "Annales de l'Observatoire de Moscou," vol. iii., has found a negative parallax (– 0″·064 ± 0″·039), using also the method of differences of declination with the same star of comparison. The results of these investigations may be taken to indicate that the parallax of this planetary nebula if measurable at all must be very small. The second paper contains Dr. Ball's observations of 61 Cygni, and his determination of its parallax therefrom. By what was at first an inadvertence, instead of using the following of the two components as Dr. Brunnow had done, the preceding one was observed, and the mistake not being remarked until the series was considerably advanced, it was resolved to complete it as begun; perhaps the result possesses for this reason additional interest. Dr. Ball finds for the parallax + 0″·4654 ± 0″·0497, which is about a mean of the values obtained by Bessel, Johnson, Peters, Struve, and Auwers, which appear entitled to the greatest weight. The observations extending from 1877, July 3, to 1878, June 1, are given in their original form. The third paper, also by Dr. Ball, relates to "observations in search of stars with a large annual parallax," forty-two stars being examined for this purpose, including several red and variable stars: the results, however, are found to be entirely negative as regards the object in view, no amount of parallax worth following up being suggested. The principle upon which the observations were made is fully described and their details appended to the memoir. The last portion of the Dunsink publication contains Dr. Brunnow's measures of double-stars 1870–73.

THE SOLAR ECLIPSE OF JULY 19.—The Observatory of Paris is situate very close upon the northern line of simple contact in this eclipse, which will add interest to observations that may be made there. The *Connaissance des Temps* employing the lunar tables of Hansen and the solar tables of Leverrier, gives the magnitude of the eclipse only 0·013 (the sun's diameter being taken as unity), commencement at 7h. 46·1m. A.M. mean time at Paris, ending at 8h. 5·4m. At Gibraltar the magnitude of the eclipse will be 0·32 at 7h. 9m. local mean time, and at Malta 0·38 at 8h. 46m. As we have before remarked the only civilised station where a great eclipse is likely to be witnessed is Aden. The eclipse is strictly an annular one, but the moon's augmented semi-diameter is only five seconds less than the sun's semi-diameter, where the greatest phase occurs near apparent noon. At Aden at oh. 12m. P.M. 97-100ths of the sun's diameter will be covered by the moon; the line of annular eclipse falls upon the opposite African coast.

PERIODICAL COMETS IN 1880.—Two known comets of short period will be observable before the end of the ensuing year, viz., Winnecke's, which may be in perihelion early in December, and Faye's, which, according to Dr. Axel-Möller, again arrives at its least distance from the sun in January, 1881. The perturbations of Winnecke's comet during the actual revolution will not be important, and from Prof. Oppolzer's elements of 1875 it seems likely that difficulty may be experienced in securing observations, the track in the heavens if we assume the time of perihelion passage to be December 1·5 being as follows:—

1880–1.	Right Ascension.	Declination.	Dist. from earth.
	° ′	° ′	
Oct. 2 ...	196 29	– 0 15	2·223
Nov. 1 ...	224 3	– 11 35	1·944
Dec. 11 ...	276 17	– 23 21	1·753
21 ...	290 43	– 23 40	1·767
31 ...	304 31	– 22 43	1·808
Jan. 10 ...	317 14	– 20 46	1·876
30 ...	338 44	– 15 13	2·072

METEOROLOGICAL NOTES

THE Eleventh Contribution to Meteorology by Prof. Loomis appears in the *American Journal of Science and Arts* for this month. With the view of inquiring whether areas of low atmospheric pressure sometimes result from a circulation of the surface winds not extending to a height of 6,000 feet, Prof. Loomis has examined eighty-nine storms and compared in each case the average direction and force of the surface winds near the base of Mount Washington with the winds at the top of the mountain. In the majority of those cases in which a storm with its area of low barometer passes over the New England States, the usual system of circulating winds which prevails at the surface, does not extend to the height of 6,000 feet. In cases, however, when the depression is unusually great, this system of circulating winds extends to that height. When the system of circulating winds reaches to the top of Mount Washington, the change of wind into the east usually begins near the base eleven hours sooner than on the top of the mountain; and the change subsequently into the west usually begins at the base five hours sooner than on the top.

IN the same paper Prof. Loomis examines eight storms, the average courses of which were approximately from south to north, and six storms which travelled from north to south, with the view of obtaining information from such abnormal storm paths, regarding the causes which determine the movement of storms with their low barometers from place to place. These two groups of storms present characteristics very different from each other. As contrasted with the other group, storms moving to northward show a central pressure, becoming more depressed as they advance; the southerly winds accompanying them are marked by a greater humidity and velocity; and the rainfall is very greatly in excess. If attention be exclusively directed to storms moving to northward the facts seem to favour the idea that in a great storm the condensation of vapour is an efficient cause which controls the movement of the winds. Storms moving to southward, however, show very different results, areas of low pressure being observed to be formed with little rain and sometimes even with none at all. The general conclusion the inquiry seems to point to is that the initial depression of the barometer is the result of a system of circulating winds, the most frequent cause of which is two or more areas of high pressure at considerable distances, often 1,400 miles from each other, differences of temperature and humidity being important agents in producing, but more especially in maintaining, such a system of winds. If this be so, then the points in the inquiry calling for the most serious attention are the causes which conspire in bringing about those wide areas of high pressure round a region of lower though still high pressure and the concentration of moister and warmer air over this region.

THE *Results of the Meteorological and Magnetic Observations for* 1878 made at Stonyhurst College have just appeared. To the routine work of the observatory has been added the preparation of an agricultural report sent weekly to the Meteorological Office; and to the usual observations are added observations of crops, flowers, shrubs, and trees, and a complete and very valuable table

of the directions in which the upper clouds (cirri) were observed to move during the year with the dates, and the direction and force of the surface winds at the same times. The meteorological observations made at Kerguelen Island during the Transit of Venus Expedition have been discussed, together with those made on board the *Challenger* and the *Erebus* and *Terror;* and the three series of results have been handed over to the Meteorological Office for publication. Their appearance will be looked forward to with the greatest interest on account of the well-marked and extraordinary differences between the daily fluctuations at Kerguelen Island and those in similar latitudes of the northern hemisphere. An extremely interesting table is given showing the monthly rainfall for the thirty years ending 1877. The results show a maximum in October and a minimum in April and May, which agree with the same phases of the rainfall over similarly situated places in this part of Great Britain. The curves of amount and frequency of rainfall show an increase during the past twenty years. They show also a minimum about 1855, and, though not a minimum, yet a distinctly marked depression about 1866, the next minimum sun-spot.

FROM the "Results of the Rain Observations made in New South Wales during 1878," just published under the superintendence of Mr. Russell, Government Astronomer, we learn with extreme satisfaction that this important element of climate is now being observed at ninety-six stations, fairly well distributed over the Colony. A large map accompanies the report, showing the positions of the rain-stations by black circles, the size of which are proportional to the amount of the rainfall for the year, the largest being Fort Macquarie, on the coast, representing 62·50 inches, and the smallest Lake Boulka, 5·61 inches. Setting aside a few local deviations, due to physical configuration, and probably in one or two cases to the shortness of the period (one year), the amounts show, as was to have been looked for, a gradual diminution from the coast inland. The manner and amount of this diminution over the different districts the observations of future years will disclose. The results of this system of observation, taken in connection with the systems of Queensland, South Australia, West Australia, and Victoria, will in a few years go far to solve the important practical problem of the distribution of the rainfall over Australia. An interesting table is given of the mean height above summer level of the Murray River at Echuca, thirty miles south of Deniliquin, from 1863 to 1878. The annual amounts show decided minima about 1866 and 1877, separated by a maximum about 1871; and the monthly amounts a great excess from July to December, when the mean height above summer level is 17½ feet, as compared with 5⅓ feet of mean height during the other six months. The annual maximum floods varied from 18⅓ feet in 1855 and 1877 to 38 feet in 1870, and the average date of their occurrence is early in October.

GEOGRAPHICAL NOTES

IN its issue for July the *Financial and Mercantile Gazette* of Lisbon publishes a map of a portion of Africa, for which it is indebted to the courtesy of Major Serpa Pinto, and on which that explorer's course through the Dark Continent is laid down. The map is rendered the more interesting by the fact that it also shows the routes followed by Livingstone, Cameron, and Stanley. Last night, as we intimated last week, Lord Northbrook, as President of the Geographical Society, gave a reception in Major Pinto's honour, at which a large number of eminent geographers and others were present.

THE Tlemcen *Courrier* (Algeria) describes a large subterranean lake recently discovered at the Cascades of Tlemcen. The opening seems to have been brought to light by some workmen who blasted a large rock at the Cascades. Entering in a rude boat the cave thus exposed they sailed for about three kilometres by the aid of torches, which revealed magnificent stalagmitic columns joining the roof and the bed of the lake. The other end of the lake seems to give off a stream at Sebdou supposed to form the source of the Tafna. The account given by the *Courrier* is rather vague. It states the lake abounds with blind fish, many of which were caught.

THE first number has reached us of a new monthly periodical, entitled *L'Afrique explorée et civilisée* (Geneva: Sandoz), to the prospectus of which we referred recently. It does not contain much new information, except, perhaps, as regards the Belgian Congo flotilla, the proceedings of which we shall watch with great interest. With the endless misfortunes of the International Association's land expedition in Eastern Africa before our eyes, we fear that great things must not be expected, unless, indeed, Mr. Stanley be eventually placed in supreme command. The number contains a map of the continent, which has been specially prepared by Lieut.-Col. Adan, the head of the military cartographical establishment at Brussels, and on which are shown the routes of recent explorers of Africa.

THE *Colonies and India* furnishes some interesting information in regard to the geographical aspects of the scheme for constructing a railway across the Sahara from Algeria to Timbuktu. An expedition is to start in September to make a careful survey of the route, and in order that it may be supplied beforehand with the best information procurable, prizes to the value of 200*l.* are offered for the best papers descriptive of the country between Golaeh and Timbuktu. Opinions appear to be conflicting as to the practicability of the scheme. M. Soleillet, whose recent journey in West Africa we have before alluded to, thinks unfavourably of it; but MM. Foureau and Fau, who have lately explored a large part of the country south of Algeria, aver that the so-called desert is hardly a desert at all.

UNDER the title of "Le Laos et les Populations sauvages de l'Indo-Chine," the *Tour du Monde* has just commenced the publication of an account by Dr. Harmand of his travels in the interior of the Indo-Chinese peninsula in 1877. The narrative is illustrated by well-executed and interesting engravings from sketches and other material furnished by the author.

THE leading paper in the June number of the *Bulletin* of the Paris Geographical Society is an Introduction to the Monuments of Geography by the late M. Jomard, edited by M. E. Cortambert; the present instalment is mainly a history of the progress in the art of map construction. M. Opegez describes a journey made by himself and some companions from Buenos Ayres to Jackal at the foot of the Andes, and Prof. Paul Chaix contributes interesting notes on Siam, an Egyptian Calendar, and the First Meridian; he does not see any inconvenience in the present variety of first meridians. We are glad to see that the *Bulletin* is getting more and more prompt in publication.

IN No. 81 of the *Zeitschrift* of the Berlin Geographical Society Herr K. Himly treats at considerable length of two Chinese cartographical works, and Herr Beuster, a German missionary, gives the result of his observations on the Vainenda, an African people settled in the north-east of the Transvaal "Republic," as he still calls this British possession. The *Verhandlungen* of the same Society, No. 6, contains a paper by Dr. Junker on his three years' travels in Central Africa; while Dr. Kiepert briefly describes some recent explorations to the north-east of the Caspian Sea, hitherto but imperfectly known.